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CIVIL AVIATION OFFICIAL ON USE OF HELICOPTERS IN NATIONAL ECONOMY

Frunze SOVETSKAYA KIRGIZIYA in Russian 13 Jul 83 p 4

[Article by N. Platonova: "The 80 Professions of a Helicopter"]

[Text] Of the more than 100 types of operations being performed today by Aeroflot in the national economy, 80 are being done by rotary-winged machines. At the request of a NOVOSTI PRESS AGENCY correspondent, Stanislav Rodionov, administration chief in the USSR Ministry of Civil Aviation, talks about the effectiveness of helicopter equipment.

At the present time, the largest volume of work is being done by machines that were created in the Design Bureau imeni Mikhail Mil'-- the Mi-8, Mi-6 and others. A special helicopter crane, the Mi-10K, which is noted for its large lifting capacity (11 tons) and maneuverability, has been created in this same design bureau for construction and assembly work. Thus, this helicopter assembles an electrical transmission line support in four-six minutes all told. A bridge across the Lovat River was assembled in five days instead of 80 thanks to the "flying crane".

Helicopters are working a great deal and usefully in the rayons of Siberia, the Urals, Yakutiya, and the Far East. The role of rotary-winged machines is especially great in the construction of oil and gas installations in Western Siberia. Temporary roads -- winter ones -- function here for only three-five months a year. During the remaining time, the helicopter is the only transportation means. Annually, approximately a million tons of freight and 4.5 million passengers are transported by these machines.

In general, the use of helicopters in the construction of mainline gas pipelines permits the labor intensiveness of the work to be decreased by no less than sevenfold. In this regard, the length of routes can be considerably shortened by straightening individual sections and laying pipes through swamps and mountains. As a result, work periods are decreased fivefold and their costs twofold-threefold.

During recent years, all of the assembly operations involved in placing foundations and electrical transmission line supports and in reeling out wires

have been performed by rotary-winged machines at especially complicated power installations. For example, during the construction of the high voltage Khabarovsk-Komsomolsk-na-Amur line with a capacity of 220 kilovolts, the use of helicopters decreased the comissioning period of the lines by more than twofold. In doing this, 275 people, who were used in other types of work, were freed.

Here are several other examples. The assembly of two electrical transmission line-500 supports has been carried out on the banks of the Volga using helicopters. The distance between the supports is 1,700 meters, the weight of each mast is 250 tons, and the height is more than 130 meters--a distinctive, two-story power bridge across the river. Compared to traditional construction methods, the helicopter assembly decreased the period for performing the work by 8 months.

In Yakutsk, 13 sections with an overall weight of 120 tons were assembled during the placement of a television mast. The use of a helicopter permitted the work period to be decreased by half a year, labor productivity to be increased fourfold, and expenditures to be decreased by more than sixfold.

Six 100-meter towers for a radiorelay line in the northern part of Tyumin Oblast were set up with the help of two Mi-10K helicopters. Compared to the traditional method, a speed-up of more than fourfold in the work was achieved. The assembly of ventilation pipes in the blacksmith casting workshop of the Kamyshinskiy Plant was performed by helicopters. More than 200 tons of designs have been assembled under complicated conditions. The economic effect was 37,000 rubles, and the time for performing the work was decreased by five months.

Aeroflot specialists and lumberjack organizations have developed the technology for transporting all types of wood by Mi-8 helicopters from almost inaccessible woodcutting areas which are located on the slopes of mountains. The aerial method for transporting the lumber permits the soil to be safeguarded against erosion, protects the young undergrowth from damage, and does not require the construction of expensive access roads.

One of the new ways to use aviation is the container shipment of fish roe and the stocking of reservoirs using Mi-8 helicopters. The annual economic effect from the introduction of containers and the automatic emission of roe into reservoirs is approximately 250,000 rubles for the RSFSR fish industry alone.

Next year, Aeroflot will begin to receive from industry Mi-26 helicopters with a lifting capacity of up to 17 tons using external suspension and up to 20 tons inside the fuselage. This is the most powerful machine of this type in the world. The use of the Mi-26 will permit geologists and oil workers to transport small drilling assemblies without breaking them down into sections -- as is being done at the present time. Power specialists will also have an opportunity to transport electrical transmission line supports weighing 12-15 tons in assembled form and not in sections.

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CIVIL AVIATION

WIDE-BODY AIRBUS WITH LONGER RANGE IN DEVELOPMENT

Moscow TRUD in Russian 31 Jul 83 p 1

[Article by N. Dombkovskiy: "A New Route, a New Airplane"]

[Text] The swiftness with which the first Soviet wide-bodied aircraft is mastering new routes, once again confirms how passenger aviation needs this comfortable airliner. Two "IL-86" recently completed the first trans-atlantic trips on the Moscow-Havana route. During a press conference devoted to the successful completion of the flight, a TRUD correspondent talked with the trip leaders and participants.

B. Panyukov, first deputy minister of USSR civil aviation said:

"Twenty years ago, an aerial 'friendship bridge', which connects our capital with the island of freedom, was opened. Now, airbuses have moved across it. We are very happy that the 'IL-86' completed its first trip over the ocean during the year of Aeroflot's 60th anniversary. The aircraft, which were developed in the Testing and Design Bureau imeni S.V. Il'yushin, proved their exceptional reliability; the flight took place without comment. It has been proven that airbuses can fully operate on transoceanic lines.

"The aircraft completed a flight of more than 10,000 kilometers, a significant part of which passed over the ocean. The flight took place with two landings -- at the Irish airport of Shannon and the Canadian airport of Gander. Our airbuses appeared for the first time in the western hemisphere. They evoked a great deal of interest among aviation specialists and the inhabitants."

After the press conference, G. Novozhilov, a two-time Hero of Socialist Labor, USSR Supreme Soviet deputy, and general designer in the Testing and Design Bureau imeni S. V. Il'yushin, answered your correspondent's question.

"Genrikh Vasil'yevich, every passenger aircraft, which has emerged from your design bureau, has become a stage in the development of our native civil aviation. The "IL-86" is no exception. Quite a few kind words have been said here about this remarkable machine. But what are you planning to offer Aeroflot in the near future?"

"We are working on all types of new aircraft in the closest contact with the Ministry of Civil Aviation. Each new machine is the fulfillment of a direct Aeroflot order. It is pleasant that the wide-bodied 'IL-86' has won popularity. However, civil aviation has already posed a new task -- an airplane, which is similar in capacity to the airbus but capable of flying much further, is urgently needed.

"Our design bureau is now creating such a machine. Preserving a large capacity, speed and comfort, the new airbus is different from its predecessor in its increased flight range. With its arrival on air routes, hundreds of passengers will be able to fly simultaneously without intermediate landings, for example, from Moscow to Khabarovsk, Magadan or Vladivostok.

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TESTING OF AN-3 CROPDUSTER UNDER WAY

Moscow TRUD in Russian 24 Aug 83 p 4

[Interview with A. Savchenko, chief of the All-Union Scientific Research Institute for the Use of Aviation in the National Economy, candidate of agricultural sciences, by N. Dombkovskiy, TRUD correspondent in Krasnodar; date not specified]

[Text] People have divided the sky into layers, Artificial satellites and orbital stations occupy the uppermost ones. Intercontinental airliners inhabit the middle. Thousands of aircraft and helicopters, called "light aviation" because of their size have modestly taken up their residency in the lower layers. This name, however, in no way corresponds to the scope of their work. The aerial workhorses are performing an enormous amount of work, especially in agriculture.

A. Savchenko, chief of the All-Union Scientific Research Institute for the Use of Aviation in the National Economy and candidate of agricultural sciences, told N. Dombkovskiy, a TRUD correspondent, about the innovations in agricultural aviation.

[Question] The AN-2 has been the main aircraft in agricultural aviation for many years. It has worked without a hitch for several decades over the fields. And here, a replacement for it has come -- the AN-3. What caused this?

[Answer] The AN-2 has indeed proven itself excellently. It is perfectly well adapted for work over the fields, simple to control, simple to operate, and reliable. However, technology does not stand still. The AN-3 is also a bi-plane, and is equipped with a more modern powerful and economical engine.

[Question] At one time, many talked about a jet airplane for agriculture....

[Answer] Life has forced us to reject this idea. Jet engines require much fuel; it pays to use them in high-speed aircraft. There, the gain in flight time pays for the large expenditure of fuel. High speed is not required for work over the fields.

[Question] It has become customary to see helicopters over the gardens and fields, however only the MI-2 and the KA-26 are now operating in agricultural

aviation. They have a small lifting capacity--they fly for several minutes and land for refueling. Is it planned to use other rotary-wing machines?

[Answer] In October, we will begin to test a suspended chemical dispenser for the MI-8 helicopter. The first results, which have been obtained during preliminary, experimental flights are reassuring. This equipment will soon begin to be widely used. As a result, work costs are lowered and the quality of cultivating crops is increased.

[Question] With each year, the biological method for working against agricultural pests is winning more and more recognition. What role will be allotted to aviation in the development of this type of work?

[Answer] An aerial method for dispensing biological preparations has been developed and successfully tested by us. It is already being used in Moldavia, Azerbaijan, the RSFSR, and the Ukraine. The entire difficulty here consists of the fact that it is necessary to introduce the preparations in microscopic doses--grams, parts of a gram per hectare. The effect from this defense, however, is enormous.

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NEW, SPECIALIZED VEHICLES PLANNED FOR AGROINDUSTRIES

Moscow AVTOMOBIL'NYY TRANSPORT in Russian No 5, May 83 pp 8-10

[Article by A. Chebotayev of the Institute of Complex Transportation Problems of Gosplan USSR and V. Nemtsov of the Ministry of Automotive Industry USSR: "Transport Vehicles for Agroindustries"]

[Text] Agriculture is a vital material production sector of the economy and provides raw material for the foodstuffs industry and food products for the population. The USSR Food Program, adopted at the May (1982) CPSU Central Committee Plenum, defined the following as the general direction for development in agriculture: specialization and cooperation of agricultural production and the creation of agroindustrial complexes, i.e., the gradual transition to an industrial base for the most important sectors--animal husbandry and plant growing.

The role and importance of motor vehicle transport in agriculture are tremendous: motor vehicle transport performs 75 percent of all shipments and carries 92 percent of the freight. As of today, the expenditures on transport amount to one-fifth of the cost of agricultural output and manpower expenditures on transport amount to one-third of the manhours involved in agricultural production.

Study of the freight traffic of the agroindustry and also future prospects for the development of various sectors of agricultural production and study of technical progress in motor vehicle transport have made it possible to establish the most rational future structure of the motor vehicle fleet, which will consist of the following vehicle types: sideboard trucks (30 percent), dump trucks (25 percent), tank trucks (12 percent), vans of various types (15 percent) refrigerated trucks (1 percent) and also flatbed trucks with various freight handling equipment and other transport vehicles (17 percent). The average freight capacity of these trucks will be 5-5.3 tons.

What new transport vehicles will be added to the agroindustry fleet in the 11th and 12th Five-Year Plans?

Bulk cargoes constitute the majority of the agricultural cargoes. These shipments should be accomplished without the use of manual labor. This can be achieved with the use of single-unit and multiple-trailer dump trucks. Specialized transport vehicles for the shipment of various bulk cargoes are being tested and prepared for production. These include the multiple-unit dump truck consisting of the KAZ-4540 allwheel-drive tractor and the GKB-8535 trailer with an 11 ton overall cargo capacity (Fig. 1). [Figures 1 through 4 (photographs) are omitted.] This is in essence a multi-unit transport and handling vehicle, which can be loaded while in motion without stopping the harvesting equipment. The possibility of low-speed travel in the fields is one of the characteristic features of this truck-trailer rig.

The Ural-557 (6x6) allwheel-drive dump-type tractor unit is also being prepared for production. It will be used in agricultural production primarily with the GKB-8535 trailer. The GKB-8551 trailer with a 7 ton cargo capacity has also been designed for operation with this tractor unit. Thus the truck-trailer rig will have an overall cargo capacity ranging from 12.5 to 14 tons.

These dump-type tractor-trailer units have several body modifications with semiautomatic locking gear and various versions of extendable sideboards, which permit the shipment of agricultural cargoes of different density. These transport-and-handling tractor-trailer rigs will provide for the hauling of that part of the agricultural produce (beets, potatoes and so on) which must be harvested in the autumn rainy season, i.e., in the "muddy" period.

Further modernization of the TMZ-879 dump-type cotton-transport trailers is also planned, since the transport expenditures per ton of raw cotton are quite high and amount to 30 percent of the total cost.

In addition to the already tested dump-type tractor-trailer unit consisting of the KamAZ-55102 truck and the GKB-8527 14 ton overall cargo capacity tractor and also the presently-under-development GAZ-SAZ-4509 diesel tractor-trailer unit with the GKB-8536 8 ton overall cargo capacity trailer and the tractor-trailer rigs with increased all-terrain capability, by the end of the 11th Five-Year Plan and the beginning of the 12th Five-Year Plan the agricultural enterprises will receive transport vehicles whose cargo capacity will exceed by 1.5-2 times the existing capacity. Studies made at IKTP [Institute of Complex Transportation Problems] show that each percent increase in dump truck cargo capacity yields the possibility of raising the productivity in the shipment of bulk agricultural cargoes by 1 percent and reducing the shipment costs by 0.71 percent. Thus, use of the new dump-type tractor-trailer rigs will make it possible to increase agricultural cargo shipment effectiveness, reduce the requirement for transport vehicles, and consequently reduce the number of drivers required and reduce the cargo shipment costs from 9-10 to 7-8 kopecks per ton-kilometer.

Many agricultural cargoes (meat and meat products, fish, milk and milk products, vegetables and fruits) require that certain temperature conditions be maintained. These cargoes can be transported in van-type trucks, primarily in refrigerated and insulated van-type bodies. According to IKTP

calculations, the national requirement for refrigerated trucks is 12,400 units (of which 5,000 units are heavy-cargo tractor-trailer rigs). Considering the specific conditions of these shipments associated with the long winter period, the requirement for insulated vans (including preheated versions) is more than 27,000 units.

On the whole, in spite of the 40 percent increase in shipping costs, the operation of refrigerated trucks, for example, in comparison with universal trucks provides a saving of up to 10 rubles a ton because of the better condition of the customer's cargoes. With regard to some types of cargo (early vegetables and fruits) this saving may be more significant--as much as 200 rubles a ton.

Considering the increased requirements of the national economy, the Soviet automotive industry is already (in the 11th Five-Year Plan) engaged in the production of new heavy-cargo refrigerated semitrailers (Fig. 2) of cargo capacity 11.5 tons (OdAZ-9772) and 22 tons (OdAZ-9768) at the Krasnoyarsk and Tiraspol truck-trailer plants. The use of these refrigerated trucks will make it possible to increase labor productivity in the shipment of perishable cargoes by 1.5-2 times.

A very important factor is the introduction of nitrogen cooling systems in the Soviet refrigerated trucks. This system has a continuous cooling cycle, is simpler in operation and does not require fuel for its functioning. The primary factors delaying nitrogen system development are the lack of servicing facilities and the high cost of nitrogen.

The shipment of livestock to the meat-packing plants and also between the collective and state farms and the feedlots is best accomplished using livestock-transport trucks. The existing livestock-transport semitrailer models such as OdAZ-857B and OdAZ-857D no longer satisfy the increased requirements of the agroindustry. Needed are qualitatively new transport vehicles which can provide both more secure transportation of the livestock and greater capacity and consequently higher transport productivity.

Tests have already been made of the OdAZ-9976 modern single-tier livestock-transport semitrailer with cargo capacity 12 tons, capable of handling 60-80 head of pigs, goats and sheep or 30-35 head of cattle. The new livestock-transport semitrailer has three sections, which makes it possible to eliminate damage to the animals during shipment, particularly when braking and on steep turns. The ventilation is much improved over the old models, which has a favorable effect on the temperature levels during transportation of the animals in the truck body. Tests conducted at Ukrmyasomoltrans [Ukrainian Meat and Milk Transport] of the new semitrailer livestock transporter showed that replacement of the OdAZ-857B livestock transporter with the OdAZ-9976 version will make it possible to reduce livestock shipment costs from 7.4 to 5.7 kopecks per ton-mile. Consequently the effectiveness of livestock delivery in the new vehicle is higher by nearly 30 percent.

Preliminary designs have now been completed of the OdAZ-997 two-tier 11 ton capacity livestock-transport semitrailer, and of the OdAZ-9958 8 ton capacity livestock transporter.

Extensive use of mineral fertilizers offers a very important reserve for intensification of agricultural production. The most effective and safest delivery of granulated, powdered and liquid fertilizers is provided by bulk shipment in removable or permanently-mounted tanks.

Among the new transport vehicles intended for the shipment of toxic liquid blended fertilizers we should mention two semitrailer tankers: the GKB-9653, cargo capacity 9 tons and the GKB-9677B, cargo capacity 13.5 tons (Fig. 3), used with the ZIL-130V1 and KamAZ-5410 saddle-type tractor units respectively. The tanks are made of resistant fiber glass and are considerably longer-lived and lighter than the metal tanks. In the future these semitrailers will be modernized and plans call for installing pumps in them to transfer the liquid blended fertilizers under field conditions.

Tests are being made of a dump-type semitrailer with enclosed body for the shipment of bulk mineral fertilizers and powder-form calciferous substances. This semitrailer is intended for use with the KamAZ-5410 saddle-type tractor unit for shipment of bulk fertilizers from the chemical plants to the dockside warehouses and underground storage facilities.

The use of semitrailers with bodies of the enclosed type for the shipment of unpackaged mineral fertilizers should ensure complete elimination of losses, i.e., this should have a significant economic effect. For example, according to American data the shipment of bulk mineral fertilizer in packaged form costs 2.3-3 dollars a ton, the cost in containers is 1.8 dollars a ton, while the cost in tanks is 0.75 dollars a ton. Savings of 1-1.5 and 2.5-3 rubles a ton of product are achieved in the USSR when shipping flour and mixed livestock feed in bulk form.

In accordance with the Food Program the annual milk consumption per person will increase in the future to 330-340 kilograms. Significant increase in the volume of milk deliveries from the collective and state farms to the regional and municipal milk processing plants is expected. Shipment in tank trucks is more efficient than in milk cans because of reduction of milk losses (by 3 percent) and the lower (by 30-40 percent) shipping costs, and the quality of the delivered milk is also improved.

New insulated milk transporters for the KamAZ trucks are already in operation. The G6-OPA-15.5 truck-trailer unit of capacity 15,500 liters (Fig. 4) and the RZ-ATsPT-11.5 fifth-wheel trailer unit of capacity 11,500 liters double the labor productivity in comparison with the milk transporters previously produced by the industry. We should note that the milk industry also needs larger trailers of capacity 20,000-25,000 liters for the MAZ-type tractor units, however the design of such milk transporters has not yet been completed.

In connection with the high efficiency of bulk shipment of beer (the saving is more than 4 kopecks a decaliter in comparison with delivery in bottles), large tank trucks are widely used. The new fifth-wheel tractor-trailer units RZ-VTsP-6 and RZ-VTsP-11 of capacity 6,000 and 11,000 liters respectively are now in operation. The tanks for these units (as for the milk transporters)

are of insulated construction and do not permit the temperature of the product being transported to change by more than 2°C in the course of 10 hours with up to 30°C temperature difference between the outside air and inside the truck body.

Production has started of tank-type semitrailers of cargo capacity 6 tons for the shipment of live fish and anhydrous ammonia, and production is also underway of tank-type semitrailers for the saddle-type MAZ-5429 tractor unit of cargo capacity 12 tons for liquid sugar. Delivery of the liquid sugar in the tankers will make possible a saving of 5 rubles a ton in comparison with delivery in bags.

Along with the shipment of food-type cargoes, large-capacity tankers are required for the supply of fuel for agricultural vehicles. Designs have been completed of aluminum and steel variants of a modern tank-semitrailer of capacity 16,000-17,500 liters for the KamAZ-510 tractor unit for the delivery of liquid fuel.

The increased output of blended livestock feed and chemical feed additives requires the development of new specialized transport vehicles. In addition to the ZSK-10 feed transporter with screw-type unloader on a ZIL-130 chassis, which is presently in production, manufacturing is underway of the new ASP-25 transport vehicle (cargo capacity 11.5 tons) with pneumatic-type unloader for the KamAZ-54101 fifth-wheel tractor unit.

The introduction of new and more effective and more productive motor transport vehicles in the practice of agricultural production by the agroindustry fully meets the requirements imposed on motor vehicle transport in regard to support of the Food Program.

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MOTOR VEHICLES AND HIGHWAYS

IMPORTANCE OF HUNGARIAN-BUILT 'IKARUS' BUSES IN USSR

Moscow ZA RULEM in Russian No 9, Sep 83 p 10

[Unsigned article: "Eighty Thousand 'Ikarus' for the USSR"]

[Text] Thirty five years ago in the Budapest suburb of Mattiasfeld the people's government of the new Hungary nationalized the semi-primitive Imre Uri Workshop, which had been fabricating motorbus bodies. This was the start of what is today one of the largest motorbus construction enterprises in the world--"Ikarus."

Today this enterprise comprises five modern body-construction plants (two in Mattiasfeld and also plants in Szekesfehervar, Pustavam and Seged), which operate in cooperation with the Rabe machine construction enterprise (front and rear axles and diesel engines) and the Chepel Automotive Plant (transmissions). The total volume of production is about 14,000 motorbuses a year. Today Ikarus produces 14 basic models for various purposes and in various configurations.

Most of the output (85-90 percent) is intended for export. The buses are shipped to 48 countries around the world, including such highly developed countries as FRG, Sweden and the U.S.A., which have their own extensive automotive industries. Assembly plants have been constructed in several countries (Iraq, Cuba and Madagascar), where parts of Hungarian origin are used to make the Ikarus buses.

The Hungarian bus builders have established special relationships with the bus users in the USSR. The Ikarus name has been familiar in the USSR for more than a quarter of a century. The first twenty Ikarus-66 buses were delivered to the USSR in 1955, while plans are to import about 7500 machines this year. More than 80,000 buses have been delivered to the USSR during these years. They are operating in the entire nation, from Mukachevo to Vladivostok.

The articulated versions of the Ikarus are particularly popular in the large Soviet cities. One such model (the "280") can carry 162 passengers at peak hours. Today 860 articulated buses produced in Hungary are serving the inhabitants of our capital, and by the end of the year this number will increase to 1000.

Ikarus bus technical information centers are in operation in Leningrad and Kiev, and groups of specialists from the motorbus fleets regularly visit Hungary to get acquainted with the latest changes in the field of Ikarus bus repair and operation.

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MINISTRY URGES FASTER COMPLETION OF RAIL FLEET REPAIR FACILITIES

Moscow GUDOK in Russian 20 May 83 p 2

[Article entitled: "More Rapid Construction and Repair of Factories"]

> [Text] A commission from the USSR Ministry of Transport Construction examined the problem of construction and repair of facilities belonging to the Ministry of Railways' Main Administration of Repairs to Rolling Stock and the Production of Spare Parts.

This year the facilities of the Main Administration of Repairs to Rolling Stock and the Production of Spare Parts [TsTVR] are supposed to be able to make repairs on the following equipment: 500 freight cars, 5 motorized car units, 70 passenger cars and 5 metro units, 24,000 electric coils, 2,000 electric motors, 35 line units and 30 diesel units. They are to produce 2,000 switches and spare parts having a value of R1.7 million. This means that 68 lines and other production facilities will be put into operation at 27 factories. Some 57,000 meters^2 of living quarters and 4 preschool institutions must be built.

The commission noted that contract work in the first four months this year for construction and repair of Ministry of Railways' [MPS] TsTVR facilities is only 91.7 complete.

In the 38 factories where organizations from the Ministry of Transport Construction [Mintransstroy] are working on production facilities, the four-month plan is only 18 percent complete. Two central directorates have met plan obligations: Railroad Construction in the North and West and Construction of Maritime and River Facilities. The main administration of Railroad Construction in the Urals and Siberia, however, is behind in its plan obligations for construction and assembly work, this with a value of R415,000. The main administration of Railroad Construction in the Volga Region and South has not completed plan obligations in 11 out of 15 factories, while Railroad Construction in Kazakhstan and Central Asia has met 79.4 percent of its obligations in factories.

And although work on industrial facilities is proceeding in 38 factories, it is actually 9 enterprises that will determine plan fulfillment for the

ministry. These are the Nizhneudinskiy Railroad Car Repair Plant [VRZ], the Popasnyanskiy VRZ, the Novosibirskiy, Dnepropetrovskiy and Muromskiy switch factories, the Ulan-Udenskiy and Velikolukskiy locomotive and railroad car repair plants [LVRZ], the Saranskiy Diesel Locomotive Repair Plant [TRZ] and the Petukhovskiy Foundry and Machine Plant [LMZ]. Work done at these plants makes up 58 percent of the annual plan for all production enterprises. But here the work pace is unsatisfactory. Suffice it to say that, after four months, the level of annual plan fulfillment is being met only at the Ulan-Udenskiy, Dnepropetrovskiy and Velikolukskiy plants. And if the work pace is not increased, then the annual plan will not be met at other factories. Out of 33 trusts working at these factories, only 19 have fulfilled plan obligations. The following trusts are notably behind in their work: Vossibtransstroy (comrade Petrov, manager) at the Nizhneudinskiy VRZ, Zapsibtransstroy (comrade Fedorov) at the Novosibirskiy and Kaztransstroy (comrade Frolov) at the Muromskiy switch factories, Yuzhuraltransstroy (comrade Makeyev) at the Petukhovskiy LMZ, Donbasstransstroy (comrade Volkov) at the Popasnyanskiy VRZ.

The commission is of the opinion that the unsatisfactory situation at TsTVR is chiefly due to underestimation of the importance of factory construction and repair by management in the following directorates: Ural and Siberia, Kazakhstan and Central Asia, and the Volga Region and the South. This, even though the construction and repair work makes up but 2.3, 6.0 and 1.6 percent of their respective output. Management of each trust fails to devote enough attention to the work and have neither enough workers nor material-technical resources for the projects. And contract officials from the trusts do not take the necessary steps to resolve work problems, including those that depend on the client factory.

The commission has decreed that the following directorates and heads of the corresponding trusts--general contractors--immediately begin to increase the work pace on construction and repair of facilities: Railroad Construction in the Urals and Siberia (comrade Minin), Railroad Construction in the Volga Region and the South (comrade Falaleyev), Railroad Construction in Kazakhstan and Central Asia (comrade Zimting), Railroad Construction in the North and West (comrade Makarov) and Construction of Maritime and River Facilities (comrade Kulikov). First of all there must be the necessary staff of laborers and supply of material-technical resources at work projects. Contracting enterprises must be consulted about the situation at factories, and the necessary measures to eliminate work difficulties must be taken. Work should be organized into two shifts at construction projects which are falling behind. For each enterprise the commission worked out specific measures designed to rectify the situation and to ensure annual plan fulfillment.

The commission also requested that the MPS demand of the TsTVR: repair of rolling stock and production of spare parts; and resolution in the shortest possible time of a series of work-related problems brought up by contracting enterprises at the Dnepropetrovskiy switch factory, the Konotopskiy and Moskovskiy VRZ's, the Tashkentskiy and Voronezhskiy TRZ's and others. The TsTVR is also to: issue project and budget reports for the Muromskiy and Dnepropetrovskiy switch plants, the Saranskiy and Orenburgskiy TRZ's, the Novorossiyskiy VRZ and others; supply equipment to and begin financing for the Novosibirskiy and Muromskiy switch factories, the Novorossiyskiy,

Moskovskiy, Panyutinskiy and Zhmerinskiy VRZ's, the Tashkentskiy and Orenburgskiy TRZ's, the Ussuriyskiy Locomotive Repair Plant [LRZ] and the Lyublinskiy LMZ.

For unsatisfactory plan fulfillment in the expansion of the Muromskiy switch factory and the Petukhovskiy LMZ, the manager of the Kazakhtransstroy Trust, comrade Frolov, has been issued a reprimand, and comrade Makeyev of Yuzhuraltransstroy a warning.

Managers of the main administrations and trusts have been warned that they are personally responsible for TsTVR plan fulfillment in 1983.

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RAIL TUNNEL CONSTRUCTION LAGGING IN ARMENIA

Yerevan KOMMUNIST in Russian 24 May 83 p 1

[Article, under the rubric "Discipline in Work Fulfillment", by S. Markosyan, KOMMUNIST correspondent: "Why Are Tunnel Workers Lagging Behind?"]

[Text] The republic has much experience in tunnel construction. Work trains are already using the Idzhevanskiy and Vurgunskiy tunnels, more than 5.2 km are finished in the Megradzorskiy Tunnel, and 1.3 km in a group of coach-line tunnels is also finished. Work has begun on a 300-meter tunnel at the 89-km post on the line--much effort is being expended here.

It seems that everything has been done to speed up tunnel construction. But, unfortunately, no significant progress is in sight, and tunnels are still not completed after many years. There are many reasons, but the main one is inexact and poor work discipline. Here is a typical example, one met with quite frequently: on the BAMtonnel'stroy section in the Megradzorskiy Tunnel (bore no. 5) work was halted in March. The management of Transport Section [TO] no. 8 of Armtonnel'stroy was to blame; because of poor operation and equipment, some 1,700 meters^3 of rock were not hauled away. It wasn't just today that the pit rails became inoperative, for this is an old "disease" of neglect. The very same thing is happening on the tunnel's southern section where brigades from Arpa-Sevanstroy are working. The following problems have still not been solved to satisfaction: drainage systems, ventilation, the supply of compressed air and electricity in the shaft. Out of the huge list of organizational shortcomings, others may be cited such as: work stoppages by groups working with concrete, the poor quality of the concrete, the severe shortage of picks, the maintenance and repair of machinery.

Work discipline is a particular problem. A check-up showed that in most tunnel pits every fifth worker failed to show up at work each day. In the final quarter last year the losses due to absenteeism in the Megradzorskiy section of Arpa-Sevanstroy amounted to 4,694 man-days, 3,561 in TO no. 8 and 4,023 in TO no. 23. And almost 600 man-days were lost in these organizations because their administrations approved the absences.

A natural consequence of these deficiencies is the sharp drop of indices for tunnel construction. Here are figures that depict plan fulfillment levels

for tunnel work (in linear meters): 633 meters of work have been completed this year in the Megradzorskiy Tunnel instead of the planned 2,000 meters, 370 out of 591 meters for the first four months this year. The figures for the group of coach-line tunnels are 575 out of 1,390 meters and 222 out of 377 meters.

The average monthly rate of work in coach-line tunnels is 7.1 meters per bore against the planned 17.8 meters; on the Arpa-Sevanstroy section the figures are 35.9 and 96.6 meters.

Planned expenditures in 1982 were to be R15 million, and R11.14, or 74.2 percent, were spent; at the same time 41 percent of fabricated tunnel work was completed, 47.8 percent of concrete tunnel work. The lack of correspondence between the amount of assembly and construction work that is finished (in rubles) with the linear figures (meters of tunnel) is cause for concern. If construction costs cannot be reduced, then the day will come when funds shall be used up. Tunnel construction will remain unfinished.

Construction of the most important railways in the republic has been called for in the decisions of the 26th CPSU Congress, and it must be finished during the current five-year plan. Work has entered the decisive phase. Management must change the way in which work is proceeding on the railroad's underground sections.

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PROBLEMS IN OPERATION OF COMPUTER, AUTOMATIC CONTROL SYSTEMS

Moscow GUDOK in Russian 28 Jun 83 p 2

[Article by I. Popovich, technical sector chief of the computer center for the North Caucasus Railroad: "Why ASU 'Balks'"]

[Text] Automatic control systems at switching yards [ASU SY] were introduced on the North Caucasus Railroad and are operating successfully. In Bataysk, for example, such a system is using the computer YeS-1010. Here the machinery operates smoothly, and telegraph lines ensure the reception of telegrams and on-location information [TGLI] at the Batayskaya technical station from all stations corresponding with it, on its own and on other railroads.

However, due to incomplete and frequently unreliable initial information, the system still cannot meet all the demands placed upon it.

Information from other railroads is poorly received. TGLI's from stations at Chelyabinsk, Penza, Nizhnedneprovsk-Uzel somehow fail to reach Bataysk, and not all TGLI's on trains from Kochetovka and Osnova are received. Owing to a lack of information, preliminary information, trains arrive in Bataysk in a circuitous route. And it frequently happens that in those TGLI's that are received there are too many mistakes in car numbering, codes for the receiving stations, shipments and shipment receivers.

There are many complaints addressed to our North Caucasus Railroad because of the poor quality of train information. Last year the railroad received more than 50 telegrams requesting improvement and reliability of TGLI's.

In order to improve the work of ASU's, a series of problems must be resolved by the Ministry of Railways main administrations of railway traffic, signals and communication and computer technology.

First of all we need a unified system of instructions for the preparation and transmission of train information from station of departure to station of destination no matter what the distance or direction of the train. It is also necessary to determine precisely just who is responsible for the transmission of train information. We should make use of the experience on the Belorussian Railroad, imposing fines along the entire network for incorrectly using TGLI's. These fines will be paid to receiving stations having ASU's.

Now the entire railroad is preparing to receive automated control systems for operational work [ASUDO/D], these based on TGLI's for all trains, whether they are made up elsewhere or at the particular station, Obviously the amount of information fed into the computer will increase several times. And without a significant improvement in the preliminary information, we must understand that the expected benefits from the system will not occur.

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PROGRESS OF MOSCOW CAR REPAIR INITIATIVE IN LATVIAN SSR

Riga KOMMUNIST SOVETSKOY LATVII in Russian No 7, Jul 83 pp 63-70

[Article by V. Sedykh, head of the Transport and Communications Department of the Latvian Communist Party Central Committee: "Improvement of Transportation Is a Common Cause"]

[Excerpt] Yet another problem is that railway cars with defects are often loaded [with freight]. Often the consigners themselves are guilty of this. Many cars are damaged during loading and unloading at the "Sarkanays Metalurgs" plant, the platforms of the Vtorchermet association, and on the approach tracks and quarries of enterprises of the Latvian Construction Material Ministry. This adds to the difficulties of transport organization. As analyses show, on three railway sections alone in the republic [Latvia] hundreds of defective cars travel monthly.

The local party committees should enforce control of the cars' use. Each case of negligence in this matter should not be let by without strict party evaluation. Explanatory and educational work with people supervising the use of cars should be promoted. Each individual should understand that a railway car is the common property of the state and people and should be preserved.

Railway workers exert a great deal of effort to repair defective railway cars and containers. With this aim, repair technology is constantly being improved and repair bases expanded. However, the specialized railway subdivisions are incapable of performing the entire volume of repair work.

Therefore it is very important that the initiative of the Muscovites who decided to help railway workers repair rolling stock and containers finds practical support in the labor collectives of Latvia's enterprises and organizations. The Latvian Communist Party Central Committee approved the initiative of the collectives of the VEF, REZ [not further identified], "Latvbytkhim," "Riga" and "Latviyas Balzams" production associations, the Vtortsvetmet management, and the "Rigaselmash" and "Sarkana Zaigzne" plants to repair railway cars and containers by their own efforts and obliged the town and district committees and managing directors to continually organize the dissemination of this valuable undertaking. Latvia's Gosplan and Gossnab were instructed to help enterprises and organizations repair railway cars and containers. Special

repair sections and brigades are being formed at industrial enterprises. Specific work loads were planned in talks between railway workers and consigners. Bilateral agreements for the repair of 10,000 cars and 1,300 containers have already been concluded.

Among the first in the republic to respond to the Muscovites' initiative was the "Latviyas Stikls" association's collective. They made an agreement with rail workers to repair rolling stock punctually. They repaired 14 cars in only 3 months this year.

The practices of the VEF collective merit attention. Here they not only repair cars and containers, but also produce new containers for transport of ready-made goods. The shop party organization and the association's party committee constantly monitor the repair process.

The Daugavpils collectives--of chemical fiber and drive chain plants, a furniture combine and other industrial enterprises are speeding up the repair of rolling stock.

A total of more than 2,300 cars were repaired in only 4 months by the republic's railway-serviced enterprises. Today every 10th defective car is repaired by industrial enterprises. The contribution is still modest, but it promotes fuller satisfaction of the transport demand.

However, there are still many enterprises which are marking time and not rushing to take on themselves extra bothers. These are the Riga Cement-Slate Plant, the Riga Construction Material Association, the Bolderays Complete Wood Processing Combine, the "Lignums" Veneer Plant, and a number of other enterprises.

The managing directors of these enterprises try to justify their sluggishness by the shortage of people, lack of spare parts and materials and lack of funding for wages. However, these arguments are groundless. By acting with initiative and purposefulness, organizing the present struggle for careful proprietary consumption of metal and wood materials, and by rationally using the existing labor resources, each industrial enterprise may put right the repair of cars and containers.

It should also be emphasized that the organization of rolling stock repair by the efforts and means of the consigners in no way removes the responsibility for this from the rail workers. Moreover, they should help instruct workers of industrial enterprises in repair technology and ensure that necessary spare parts arrive at enterprises on time. The quality of repair must be strictly monitored. It should be performed in strict compliance with current transportation requirements for assuring the safe travel of trains. After repair at the enterprises, cars and containers should be suitable for inclusion in a train and should fully guarantee the safe travel and safekeeping of transported cargo. In fact the opposite often happens.

Inspections showed that sometimes the performance of repair work violates technical norms and requirements for this or that type of repair. At times,

materials inadmissible under rolling stock operating procedures are used for repairs, and carpentry and welding work is done poorly. As a result, such repair is of little use: after the car is unloaded it requires more repair.

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CONTINUED DEVELOPMENT OF REGENERATIVE BRAKING SYSTEMS URGED

Moscow GUDOK in Russian 6 Sep 83 p 2

[Article by V. Shul'ga, professor and doctor of technical sciences, and N. Lobanova, senior teacher at the Moscow Institute of Railroad Transportation Engineers: "What We Have and What We are Losing"]

> [Text] In its pages the newspaper has several times raised the point that, in addition to its well-known pluses, regeneration also has significant minuses. This was the subject of an interview given by scientists at NIIZhT [Scientific Research Institute of Railroad Transportation] to our correspondent and published in the newspaper on 17 May 1983 under the title "The Efficiency of Regeneration." While it is a reliable way to increase traffic safety in sectors with steep grades while also significantly conserving energy resources, regeneration also increases wear on the track and rolling stock. All this has already been established by appropriate scientific studies, and a quantitative evaluation has even been made. It is time to begin working out measures to reduce the negative effect of regeneration on transportation facilities and rolling stock. This will be the subject of the article published below.

The economic efficiency of regenerative braking on trains must be determined by comparing all the costs and benefits related to its use. This problem has a technical and economic content which has been thoroughly analyzed in the works of Soviet and foreign scientists. For example, studies by scientists at VNIIZhT [All-Union Scientific Institute of Railroad Transportation] and DIIT [Dnepropetrovsk Institute of Railroad Transportation Engineers] established that the cause of the unfavorable dynamic effects of a train on the track during regeneration is that it is transformed into a broken sectioned chain, in connection with which additional transverse horizontal and vertical forces appear.

Further scientific work by these institutes as well as NIIZhT and KhabIIZhT [Khabarovsk Institute of Railroad Transportation Engineers]

permitted the first approximate determination of the additional wear on and damage to elements of the track superstructure where regeneration is employed. It was found the wear depends on the characteristics of the plane and profile of the track. Specialists in the field of locomotives, for their part, produced an estimate of the increased wear on the rims of pairs of locomotive wheels when regeneration is employed.

The problem arises of consolidating these estimates into a comprehensive one which would reflect not only the efficiency of regeneration but also make it possible to regulate its use wisely under various conditions of transportation work.

At the present time the department of construction economics at MIIT [Moscow Institute of Railroad Transportation Engineers] has developed a methodology for determining the efficiency of regenerative braking. It is based on the results of long-term studies of the use of regeneration on sectors of the Southern Urals, Donets, and Moscow railroads. Specifically, they have determined changes in material and labor expenditures depending on the steepness of grades, the radius of curves, traveling speeds, and the degree of wear of regeneration sectors.

Let us cite a few conclusions. Where the radii of curves are more than 650 meters rail damage during regeneration increased 1.5 times, while on sectors with curve radii of 300 meters the figure was 2.5 times. The increase in the damage to ties, use of ballast, labor expenditures, and number of warnings to reduce speed were also found to be differentiated by the basic characteristics of the plane and profile of the track.

It was also established that the negative effect of regenerative braking on the condition of the superstructure increases with an increase in the tonnage allowed on sectors, which means with more wornout track. Thus, where 500 million gross tons had been allowed to pass rail damage was twice as great as where the tonnage was 300 million gross tons. In this case most of the defective rails have cracks and dents in the head, which significantly reduces the possibility of using them as old replacements, which also means it reduces return amounts.

Comparing the criteria of efficiency for different track characteristics and indicators of operations work, we established a range of rational application of regeneration. On sectors of the Southern Ural Railroad, for example, the use of regenerative braking for curve radii up to 350 meters and gross tonnage of more than 400 million tons entails economic loss. Where curve radii are greater than 350 meters and the tonnage that has passed over the track is less than 400 million gross tons regeneration is efficient and produces an annual savings of roughly 1,200 rubles per kilometer.

Does that mean that it is inadvisable to use regeneration outside these limits? The question should probably be put differently: What must be done so that regeneration, an essential technical resource, can also be

economically efficient outside these limits? It seems to us that defining these limits is precisely what makes it possible to correctly orient the efforts of scientific workers and road services in the matter of further increasing the efficiency of regeneration.

Specifically, it suggests the need for priority reconstruction of track sectors which have the most difficult braking conditions. Increasing the radius of curves not only increases the speed of train travel, but at the same time makes it possible to reduce the negative effect of regenerative braking on the track and lower operating expenditures.

The use of the SAURT [System for Automatic Control of Regenerative Braking] developed by scientists at MIIT in cooperation with personnel of the Zlatoust depot is producing good results. This was confirmed by the experience of the Southern Ural and Dnepr roads. Damage to traction engines caused by flashover has stopped, the skidding and wear of the rims of locomotive wheels has been reduced, and the expenditure of sand has been cut. Application of the proposal by scientists at NIIZhT on turning the rims promises to increase the economic impact of regeneration also.

Using the comprehensive methodology, scientists from MIIT prepared practical recommendations on determining the efficiency of regeneration on the Southern Ural Road. Similar recommendations should be worked out for each road taking account of the characteristics of the track, rolling stock, and conditions of operations work.

According to our conclusions, it is necessary to increase the norms of operating expenditures and labor expenditures differentially for regenerative braking sectors, dependent on the characteristics of the track plane and profile. For example, these norms should be increased 2-2.5 times for maintenance of sectors with curve radii up to 350 meters, while for sectors with curve radii of 250-350 meters and grades of greater than eight per mille the norms of tonnage use between repairs should be lowered.

Economic calculations demonstrate the wisdom of carrying out certain investment measures also. Specifically, the track should be reinforced in complex sectors and the catenary system must be paralleled; this will make it possible to use regenerative energy more efficiently.

Technical and economic studies on the application of regeneration should be prolonged. They should be carried out on the basis of a target program that combines the efforts of scientific research institutes, normative organizations, VUZes, and main administrations of the Ministry of Railroads.

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ENGINEER'S NEW RAIL TANK CAR DESIGN WINS PRAISE

Moscow GUDOK in Russian 13 Sep 83 p 2

[Article by V. Kurkov, Novosibirsk: "The Inventor of...the Tank Car"]

[Text] No doubt this title sounds like someone has re-invented the wheel. But no matter how many clever remarks people make about how such inventors just will not stop, new developments of the same old wheel are registered as patents almost every year. This is obviously proof of the unlimited potential of creativity.

The railroad tank car also appears simple and clearly understood. What is there about it that is tricky? A tank is mounted on standard bogies, and that is all. The rest is details: a loading hatch, draining devices, and ladders. That is how simple everything is. But the tank car has many problems. How can it be filled quickly and without losses? How can we prevent the contents from splashing out en route? What is a quick and safe way to remove the product at its destination? How can we prevent solidification? There are numerous other questions as well.

The Novosibirsk Institute of Railroad Transportation Engineers has a scientific research laboratory that studies preservation of freight being shipped and rationalization of shipping. It is the only such laboratory in the country. The title of one of the research areas is "Refinement of Rules for Shipping Dangerous and Liquid Freight." Senior scientific associate and engineer Aleksandr Khristolyubov is a regular member of this project. He graduated from the Novosibirsk Institute seven years ago, worked for a short time at one of the stations, and then was invited to join the laboratory. Of course the invitation was not accidental; they knew him to be a diligent, concentrated, and efficient man and these are precisely the most essential qualities for a researcher.

And now, here is his first invention.

Events such as discoveries, inventions, defenses of dissertations, and the receipt of State Prizes and honorary titles are announced at NIIZhT by publication of "special news bulletins." One appeared on this occasion as well: "Senior scientific associate of the freight preservation research lab A. V. Khristolyubov received author's certificate No 955844

for invention of a railroad tank car to carry viscous products. We congratulate the young scientist on his first invention!"

We will talk about the tank car a little later. Right now let us tell something about the inventor himself. He travels a great deal. He travels a great deal and he goes far. It would be hard to name a trunk road that he has not traveled while working for the laboratory. This is a kind of testimonial to the young specialist's broad perspectives, independence, and solid engineering training. Otherwise they simply would not send him on long, important work trips.

Our readers can also form an opinion of the civil posture of engineer Khristolyubov. In the last four years GUDOK has published four reports from him: "Temperature Reserve," about choosing optimal temperatures for oil products when pouring them into tank cars and the economics of this optimization; "Ill-Fated Bolts Elevated to the Rank of Problem," about losses of oil products during transportation and the work of points that prepare tank cars for loading and pouring the liquid; "Candy from All Around the World," about irrational, too-long counter shipments; and "Closer by a Circular Route," about the problems of conveying passengers on the routes from Siberia to Central Asia and the Black Sea coast.

Now for the problem itself, the starting point of engineer Aleksandr Khristolyubov's creative search, a kind of social mandate to turn his thoughts in precisely this direction. It is simple to carry gasoline, kerosene, or oil, alcohol, and water in tank cars. It is poured in, carried, and removed with no problems. But these "light" products are only half of all shipping in tank cars, and not even the larger half. The rest is mazut oil, standard oils, crude petroleum, glycerine, fats, and molasses. Even at temperatures above freezing the "viscosity" of these products leaves much to be desired. But how can we drain the contents of tank cars in the winter? That is a problem.

Everybody solves the problem "in their own way." They put tank cars in warm buildings, if they have them, or heat them up with steam and electric heaters of the most varied and original designs. Finally, we even know of cases of mismanagement where they decide to leave part of the liquid in the car. There are standard norms for draining a car: two hours in the summer and 10 in the winter. They are standard because even this time is frequently not enough depending on local conditions. Although two hours in the summer is plenty. According to numerous experiments by the lab at NIIZhT grade 100 Mazut oil (the most viscous) can be drained from a tank car in 7-10 minutes!

There is a rule in invention work to study all earlier work before you undertake a problem. It turned out that there were an enormous number of ways of heating the contents of the tank car. And almost all of them had one significant drawback, they began to heat from the middle or top pouring hatch. It was difficult to reach the bottom and completely impossible to get into the lower front and back corners. Residue after draining was considered almost inevitable.

There are special tank cars with "heat jackets"; the lower half of the tank has double walls and steam or hot water is pumped between them. This appears to be a good solution, but this "jacket" takes up to 1.5 tons of additional sheet steel, even more for an eight-axle car. It is an expensive solution. Moreover the volume of the tank is reduced. Therefore, few such tank cars are being produced. It is not always possible to ship viscous loads in " ertushki" [trains on set routes between two cities], so most of these products are sent in individual cars. Therefore, this special rolling stock becomes "lost" in the general fleet almost immediately. And the problem remains unsolved.

A patent search presupposes familiarity with foreign developments also. Here is one project, perhaps the most interesting one. A perforated pipe is set across the bottom of the tank car. A heat medium is pumped through it: water, steam, or the product being carried, only heated. Perhaps this is precisely what we need? The calculations were made and the answer was, no. The perforation causes pressure at the end of the pipe to drop sharply, and the thickest points at the front end back of the tank remain unheated. This idea was developed by engineers in a country which does not have winter as we know it. They have 27 days a year with the temperature below -5 degrees.

And then Khristolyubov proposed a fundamentally new solution. On top of the tank of the car is a coupling pipe and right under the casing inside the tank is unperforated tubing. At the ends of the tubing are nozzles inclined to direct the heat medium into the lower corners of the tank car. Is that all? It is typical that the best technical concepts are distinguished by precisely such simplicity.

Now let us discuss the advantages of this method over other ways of heating products in shipment. These advantages were noted by the State Committee for Inventions and Discoveries. The first is simplicity of design. The second is that it takes just 30 kilograms of metal (not the 1.5 tons required for the "heat jacket" of the special tank cars). And the third advantage is the possibility of heating while keeping the top hatch completely sealed, which means absolute fire safety and preventing environmental pollution. The pressure of the heat medium can be raised as high as you like; the only restriction is the strength of the tank itself.

In invention work it sometimes happens that as you solve the target problem other advantages of the proposed technical concept turn up along the way. That is the case here. In the opinions of specialists and the inventor himself, having this kind of tubing with nozzles inside the tank with an outlet to the connecting pipe on top will simplify and speed up car cleaning at washing-steaming points and make it practically harmless to the environment. When washing and steaming is done through the top hatch clouds of steam mixed with those products which were shipped in the car rise above conventional tank cars. This is considered inevitable. But when tank cars equipped with the devices proposed by engineer A. Khristolyubov are steamed out they do not have to be opened. The hot steam is fed to the outlet of

the internal pipe. The used steam can be taken out through the tubing connected to the lower drain valve and delivered to decontamination facilities. The airtightness is complete.

Several years ago railroad car building engineers in Zhdanov asked the laboratory at NIIZhT to conduct comparative tests of methods of heating various types of viscous products. The freight preservation lab, as already noted, is the only one in the country. Other concerns got in the way of this study. But even without this it was known that each of the existing methods had shortcomings. The patent issued to engineer Khrisolyubov does not note any shortcomings, and the advantages -- technological, technical, economic, and ecological -- have already been mentioned.

So we can consider that the first invention of the young scientist from Novosibirsk solved one of the most critical problems in transportation. The main advantage on which the inventor was primarily counting was draining time. Even during the coldest weather of the winter draining viscous products from the tank cars will take minutes instead of hours.

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SEMINAR ON RATIONALIZATION OF PETROLEUM PRODUCT TRANSPORT

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 8, Aug 83 pp 77-79

[Text] The USSR Ministry of Railways, the USSR Goskomnefteprodukt, the USSR Academy of Sciences Scientific Council on the Complex Problem of a USSR United Transport System and the Leningrad Railway Transport Engineering Institute held the All-Union Scientific Technical Seminar for Rationalization of Petroleum Product Transport in Leningrad. Present at the seminar were representatives of the USSR Gosplan, USSR Gossnab, Ministry of Railways, USSR and RSFSP Goskomnefteprodukt, Ministries of the USSR Petroleum Refining and Petrochemical Industries, USSR maritime fleet, RSFSR river fleet, a number of other ministries and departments, the Bashkir branch of the USSR Academy of Sciences, the Lengroispolkom, and the Oktyabr road management. Workers of the scientific-research and academic institutes and design organizations involved in the research, design, planning, material and technical supply and transport of petroleum products participated actively in the seminar's work.

There was a broad exchange of opinions on scientific and technical problems, work on the rationalization of petroleum product transport on the united transport network was summed up, and joint measures for work coordination were planned. They examined in detail the prospects for developing and improving of petroleum product transport and expansion of pipeline construction, problems of improving the transport of this cargo on the nation's united transport network, by railway and river transport and in the RSFSR and Ukrainian SSR Goskomnefteprodukt system. Also analyzed were the developmental trends for improved transport of petroleum in the long term. A number of lectures were devoted to the improvement of planning, particularly the drafting and introduction of a combination of delivery and transport planning tasks within the limits of the ASUnefteprodukt [Central Automated Management for Petroleum Products], transport of petroleum products within the framework of Minneftekhimprom's ASU, and the methodological principles of freight transport planning on railway transport. They examined the development and specialization of a variety of petroleum products, taking into consideration the transport factor, and showed its influence on the disposition of the gas industry.

A major consideration was the optimization of transport and economic links, in particular, the drafting of petroleum product transport plans on the united transport network, combined optimal freight-flow schedules on railway transport, and an industrial model of transport optimization during combined use of

various types of transport. Also examined were problems of optimizing the intra-rayon transport and economic links and ways of improving these links in the Tyumen oil and gas complex and other rayons were planned.

It was observed that the reduction of petroleum product transport in the USSR Goskomnefteprodukt system depends on the optimal allocation of resources, coordination of railway, pipeline and river transport work, and the rational location of petroleum-refining sites. Thus, the construction of new petroleum-refining plants in Mozyr, Pavlodar, Mazheykya and Lisichansk, and the development of capabilities in active enterprises shortened the distance of petroleum freight transports on the railways.

In recent years the USSR Goskomnefteprodukt jointly with other ministries within the framework of the USSR Gosplan's Interdepartmental Commission for Improved Transport worked specifically to eliminate cross-hauls and inefficient hauls. Thus, due to the accomplishments of 1980-82, the average hauling distance of petroleum cargo on the railways was reduced by 32 km, and amounted to a 34.4 million ruble saving of transport expenses.

Still, railway transport continues to practice inefficient transportation of petroleum products. According to estimates, regulation of the distribution of gasoline products will help reduce freight turn-around by 3.2 billion t/km, and improved production planning of summer diesel fuel will help reduce the average distance, which is presently 1,500 km. There are especially large disproportions in the location of low-sulfur mazut production. The general volume of cross-hauls for this brand of fuel just in the confines of Kazakhstan and Siberia is over 7 billion t/km. The planned resources of petroleum product refining do not sufficiently account for the transport factor, and the formulated operating plans are noted for instability; production plans also change according to the product variety. This complicates planning and causes significant deviation from the work schedules of normal directions of freight flow.

In the opinion of specialists of the Leningrad Railway Transport Engineers Institute (LIIZhT), the solution to the intersectorial problem of improved transport of petroleum products requires an optimal base systems approach. The calculation of three basic factors (production-transport-demand) will provide more effective use of economic and mathematical computer techniques in transport planning. Presently, with the aid of economic and mathematical models, the USSR Gossnab Main Computer Center and the LIIZhT [Leningrad Institute of Railroad Transportation Engineers im. Academician V. N. Obraztsov] completed over 100 calculations of optimal plans for Goskomnefteprodukt. Over 334 million tons of petroleum products were examined in the calculations. On this basis, schedules of normal freight-flow directions were drafted jointly with the Chief Freight Management of the Ministry of Railways and the USSR Goskomnefteprodukt's Petroleum Product Transport Management.

The experience of drafting these schedules and the necessity of correcting them due to the changes in resource and railway allocation requires automation of the schedule structuring process. At present, the Leningrad Railway Transport Engineers Institute has developed a model of a multi-product transport task, based on a linear programming task.

Major problems are associated with the prospective formation of a united transport system using an optimal base. The fundamental problems of laying pipeline mains and formation of a petroleum product distribution system must be solved here based on the coordination of the work of various types of transport.

The ASUnefteprodukt Central Design Bureau is conducting fruitful work on planning the delivery and transport of petroleum products under actual conditions. The bureau developed and put into industrial operation tasks of primary balancing of resources and petroleum products demand, and formation of optimal plans to provide consumers with a variety of goods while observing the existing schedules of normal freight flows.

River transport of petroleum products is expected to increase by 8-11 million tons by 1985. The drafted measures for 1983 will allow switching of 600,000 tons of petroleum cargo from rail to water and a 1.5 billion t/km reduction of the railway's work load. In recent years the products list of transported petroleum products and amount of work at principal freight-generating points and transfer bases have increased. The practice of using oil and ore carriers has shown that expansion of the river fleet's sphere of activity is most effective when based on the use of the mixed navigation "river-sea" class of tankers. Freight-flow analysis indicates that the existing transport volume from the Volga-Kama basin's petroleum refining plants to the Black Sea ports can be increased by 2-3 times if the new "river-sea" class tankers are utilized. Improving the use of the fleet's transit capacity will depend to a large extent on the development of a number of capabilities of the RSFSR Goskomnefteprodukt's transfer tank farms, and the construction of berths to receive mazut. According to estimates, this will allow to cut back more than 4.5 million tons of furnace fuel oil from the railway.

Problems in developing pipeline transport of petroleum products were examined in depth at the seminar. According to the data of the USSR Gosplan's Complex Transport Problems Institute, the economically sound share of railway transport in transport of petroleum products should not exceed 50-60 percent. In the last 5 years petroleum product transfer by pumping has increased by 30 percent. In the opinion of specialists of the USSR Goskomnefteprodukt, it is advisable to increase the throughput of a number of operative pipeline mains working under especially intensive conditions. Regional petroleum product pipeline systems should receive further development. The growth of the petroleum product pipeline network should be oriented toward increased ramification and improved servicing of petroleum product consuming regions and an increase in construction tempos.

A large operation is being carried out at the Ministry of Railways' Chief Freight Management with respect to the improvement of petroleum product transport. Positive know-how in the drafting of normal schedules of petroleum product freight-flow directions was gained here in cooperation with specialists of scientific and academic institutes. The formation of such schedules for diesel (winter) and motor fuel and other brands of petroleum products is planned in the near future.

In examining the problems of techniques to improve transport planning, it was emphasized that the problem of transport improvement is closely linked to improvement in delivery. In the opinion of specialists of the All-Union Scientific Research Institute of Railway Transport, the inadequate economic foundation of plan indicators creates conflicts between the overall dimensions of transport productivity and the actual transport plans. A system of transport and economic balances should become the economic planning base for the sound distribution of petroleum product transports among the different types of transport.

The Bashkir branch of the USSR Academy of Sciences is researching the formation of efficient transport links using data for regional demand of the national economy for petroleum products. With the developed forecasting methods it is possible to establish the regional, long-term norms for providing petroleum products and, thereby, to increase the validity of monthly transport plans on various types of transport.

The Novopolotsk Polytechnical Institute is studying problems of transporting petroleum products by container hydrotransport. Such transport of viscous petroleum products has significant economic advantages over existing transport means, and above all, reduced costs of preparing petroleum products for transport. It is estimated that the implementation of such delivery of bitumens from the Kirishi Petroleum Refining Plant to Leningrad will allow an annual saving of more than 600,000 rubles.

The Ufa Petroleum Institute is working out problems of the efficient use of gas pipelines to deliver small batches of petroleum products, optimization of petroleum pipeline and petroleum product pipeline working conditions, and reduction of petroleum pipeline transport costs with regard to transshipment costs. Based on a cost study of 25 large transshipment bases over a period of 10 years, techniques to calculate transshipment costs were developed and the actual cost level at petroleum bases was established.

The Azerbaijan Polytechnical Institute is involved in minimizing the risk of disrupting the petroleum products transport plans in the united transport system. The primary practicably predictable fluctuations in transport volumes, as defined by graphs were analyzed, and recommendations made on the estimate and calculation of these variations in transport planning.

The Rostov Railway Engineers Institute is researching the improved efficiency and reduction of short-run petroleum product transports. Currently, zones for the sound redistribution of short-run transports between railway and highway transport have been determined; procedures, an algorithm and a program for calculating them have been developed.

On the whole the seminar's work showed that the ministries and departments are working to improve the supply of petroleum products to the economy. The branch and academic organizations and institutes are conducting research on transport optimization, and developing schedules of normal freight-flow directions based on optimal plans for petroleum product transport within the united transport network, automation of planning estimates and control of delivery

and transport planning and control, and calculation of the demand for petroleum products in a regional profile. Still lacking, however, is organizational and methodological unity in the development and implementation of efficient transportation of petroleum products within the united network.

In the opinion of the seminar participants, the complex and interrelated solution to the problems of optimal organization of production, transport and continuous meeting of the national economy's demand for petroleum products should be guided in the following directions: planning levels (union, republic, territorial, at separate technological sites); planning horizons (prospective, current and operative control of transports and deliveries); supply means (economic and mathematical models and methods, an information base, and supply of technical means to organizationally legal technology). The solution to each specific problem must be examined in all indicated aspects.

At the seminar the question was raised about the organization of a continuous workshop on improving efficiency of petroleum transport within the united transport network, whose activity would be linked to the work of the USSR Gosplan's Interdepartmental Commission. This is essential in order to assure the orderly and organizational coordination of scientific research work, drafting of recommendations on complex scientific and technical problems, and presentation of regular general and specific seminars on complex scientific and technical problems.

It was noted in the seminar's resolution that improvement of the efficiency of petroleum product transport via different types of transport should be carried out based on the development and updating of standard schedules of petroleum product freight patterns currently in force; improvement of methods for optimizing scheduled petroleum transport plans; increase water transport of cargo during the navigation season; introduction of new techniques and technologies for petroleum product transport; drafting of scientifically valid norms for petroleum product reserves.

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